



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/719,010	12/07/2000	Akira Miyazaki	017498/0149	5826

7590 10/28/2002

Richard L Schwaab  
Foley & Lardner  
Washington Harbour Suite 500  
3000 K Street NW PO Box 25696  
Washington, DC 20007-8696

EXAMINER

CROWELL, ANNA M

ART UNIT	PAPER NUMBER
----------	--------------

1763

DATE MAILED: 10/28/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/719,010

Applicant(s)

MIYAZAKI ET AL.

Examiner

Michelle Crowell

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 August 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                              | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)          | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____.                                   |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (Japanese Patent Publication 10-092796) in view of Ando (Japanese Patent Publication 01-213910) and Koshiishi et al. (U.S. 5,919,332).

Referring to Drawing 1, abstract, and paragraphs [0010], [0012] – [0016], Imafuku discloses a plasma treatment device using a polycrystalline alumina sintered product which has high plasma resistance. This plasma treatment device comprises a processing container 4 (reaction chamber), showerhead 36 (upper electrode), installation base 6 (lower electrode), clamp ring 24, which is used to hold the wafer W and used as a focal function (focus ring) to direct ions to the wafer W [0013]. The clamp ring 24 and shield ring 46 are made of the polycrystalline alumina sintered product. The polycrystalline alumina sintered product is made of alumina and magnesia (MgO) and has a purity of 99.9%, a bulk density of 3.98 g/cm<sup>3</sup>, and an average grain size of 10-100 micrometers.

Referring to Drawing 6, and paragraphs [0023]-[0024], Imafuku discloses that an electrostatic chuck 70 can be used to hold the wafer instead of a clamp ring. In addition, the focal ring 78 is used to direct ions to the wafer W [0024].

Art Unit: 1763

Imafuku fails to teach the Si and alkali content, surface roughness, electrode insulating member, and a covering member.

Referring to Figure 20 and column 27, lines 9-12, lines 46-60, Koshiishi teaches a plasma processing apparatus comprising a seal ring 125 (electrode insulating member) for electric insulation between the upper electrode 102 and the chamber 10, and a focus ring 119. Both the seal ring 125 and the focus ring 119 are made of quartz and have alumina-based ceramic layers 120 and 126 over them. The alumina has a surface roughness of  $2\mu\text{m}$ , to prevent secondary reaction products from sticking thereto, and to facilitate removal of any products. In addition, an alumina-based ceramic layer 131 (covering member) is provided along the chamber walls. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the alumina sintered product of Imafuku with surface roughness as taught by Koshiishi, and to provide the apparatus of Imafuku with the electrode insulating member and covering as taught by Koshiishi. This would protect the apparatus and parts from plasma damage, therefore extending the life of the parts, and prevent sticking to the parts.

Referring to constitution, Ando teaches an alumina composition to have a Si content of less 80 ppm, Mg content of less than 60 ppm, and alkali components less than 60 ppm. This alumina composition has excellent machinability qualities, good mechanical strength and high resistance to plasma. It would have been obvious to one of ordinary skill in the art at the time of the invention for the alumina sintered product of Imafuku to have a composition as taught by Ando. This would provide the alumina sintered product with excellent machinability, good mechanical strength and high resistance to plasma.

Art Unit: 1763

3. Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Imafuku et al. (Japanese Patent Publication 10-092796) in view of Ando (Japanese Patent Publication 01-213910) and Koshiishi et al. (U.S. 5,919,332) as applied to claim 1-4, 6, and 7 above, and further in view of Matsubara et al. (U.S. 6,149,730).

Imafuku in view of Ando and Koshiishi disclose the apparatus substantially as claimed, however fails to show a cover body.

Referring to Figure 2 and column 8, lines 1-35, Matsubara shows a chemical vapor deposition apparatus which uses a ring-shaped member 111 (cover body) to cover a peripheral portion of the wafer 106 (body). This ring-shaped member 111 prevents plasma processing on the peripheral portion of the wafer. It would have been obvious to one of ordinary skill in the art to provide the apparatus of Imafuku in view of Ando and Koshiishi with the cover body as shown by Matsubara. This would prevent plasma processing on the peripheral portion of the wafer.

#### *Response to Arguments*

4. Applicant's arguments filed August 16, 2002 have been fully considered but they are not persuasive.

Applicant has argued that the claimed invention provides unexpected results in comparison with the closest prior art. The unexpected results are not commensurate with the claimed range of 18-45  $\mu\text{m}$  for the average grain size, surface roughness of 0.8-3.0  $\mu\text{m}$ , and a bulk density of 3.90  $\text{g}/\text{cm}^3$ . The results in Tables 1 and 2 only show data for average grains sizes of 21.7-40  $\mu\text{m}$ , Ra of 1.1-2.2, and density of less than 4. To show unexpected results, the data

must be commensurable with claimed range of 18-45  $\mu\text{m}$ .

GM  
10/25/07

S.

Art Unit: 1763

Applicant has argued that Ando is nonanalogous art. In response to applicant's argument that Ando is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Ando is pertinent to the problem of using a material that is highly resistant to heat and high voltage. Likewise, plasma resistant members must be resistant to heat and voltage. Ando refers to a material used in spark plugs, which must be durable and highly resistant to high voltage, therefore Ando is considered analogous art.

#### ***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


Art Unit: 1763

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC *ame*  
October 25, 2002

  
GREGORY MILLS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700